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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/689,658	10/13/2000	TOKURO OZAWA	107260	7418

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EXAMINER

AWAD, AMR A

ART UNIT PAPER NUMBER

2675

DATE MAILED: 09/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PRH

Office Action Summary

Application No.
09/689,658

Applicant(s)
OZAWA

Examiner
Amr Awad

Art Unit
2675



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Oct 13, 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-9 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 5, 7 6) ☐ Other:

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DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The references cited in the Information Disclosure Statements filed October 13, 2000 and July 24, 2002 have been considered by the Examiner; see attached PTO-1449.

Drawings

3. Figures 10-11 should be designated by a legend such as --Prior Art-- as indicated in Applicant's specification (page 1, lines 12-13, page 4, lines 3-6 and page 5, line 30) because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1, 4 and 7-9 is rejected under 35 U.S.C. 102(e) as being anticipated by Matsuura et al. (US patent NO. 6,175,351; hereinafter referred to as Matsuura).

As to independent claim 1, Matsuura (figure 1) teaches a display apparatus (11) that includes driving circuit (A/D converter 20R, 20G, 20B; a memory 30; D/A converter 50 and data transfer circuit 60) for an electro-optical device (pixel display portion 100) that performs image display by driving a plurality of pixels form in a matrix on a substrate "(a)" according to analog image signal (input analog video signal) (col. 12, lines 18-34 and col. 13, lines 53-56). Matsuura teaches that the driving circuit includes an A/D conversion circuit (A/D conversion elements 20R, 20G and 20B) that converts the analog image signal into a digital signal (col. 12, lines 22-24), a storage device (memory 30) that stores the digital signal (col. 12, lines 25-28), a D/A conversion circuit (50) that converts a digital signal which stored in the storage device (30) into an analog signal (col. 12, lines 30-33) and supplies the analog signal to the pixels (for that, Matsuura teaches a data transfer circuit 60 for transferring the data signals received from the D/A 50 for display to the pixel display portion 100) (col. 12, lines 33-35).

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As to claim 4, Matsuura (figure 1) teaches that the storage device (memory 30) storing a plurality digital signals obtained from the A/D conversion circuit within a fixed time (col. 12, lines 21-30). Matsuura teaches that the D/A conversion circuit comprising a plurality of D/A converters (col. 12, lines 30-31) that convert a plurality of digital signals stored in the storage device (30) into analog signals and that supply the analog signals to a plurality of pixels (col. 12, lines 31-35).

As to claim 7, Matsuura (figure 2A) teaches that the driving circuit further comprising thin film transistor (for that, Matsuura shows that each pixel includes driving circuit (i.e, part of the whole driving) and which includes TFT 3) (col. 14, lines 51-54, and col. 2, lines 31-32 which specifies that element 3 is TFT). Note also that Matsuura teaches that all elements in figure 1 are located on the same substrate (col. 13, lines 53-56).

As to claim 8, as discussed above with respect to claim 1, Matsuura (figure 1) teaches an electro-optical device (an image display apparatus) which includes driving circuit (col. 12, lines 18-34).

As to claim 9, Matsuura (figure 1) shows the device being used as an image display apparatus (col. 12, lines 14-15). Matsuura also teaches that the display apparatus can be used in electronic apparatus (col. 16, lines 57-63).

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6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura in view of Dingwall et al. (US Patent NO. 5,600,345; hereinafter referred to as Dingwall).

Note the discussion of Matsuura above. Matsuura (figure 1) further teaches a path that supplies a digital signal obtained from the A/D conversion circuit(20R, 20G and 20B) to the storage device (30) (the path is the connection which supplies the digital signal form A/D to the storage 30) (col. 12, lines 21-28). Matsuura does not expressly teach a path that supplies a digital signal received from an external circuit to the storage device.

However, Dingwall (figure 1) teaches a liquid crystal display device that includes an A/D converter (14) which converts the inputted analog signal from an analog circuitry (11) to a digital signals and inputted to a digital storage (21) (col. 2, lines 32-37). As can be seen in figure 1, Dingwall teaches having a path that supplies a digital signal (DATA CLOCK) received from external circuit to the storage device.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the teaching of Dingwall having a digital signal (clock signal) applied to the storage device to be applied to Matsuura's device because the clock data signal is

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essential in synchronizing the data outputted from the storage device to the respective D/A converter.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura in view of Da Costa (US patent NO. 6,100,879).

Note the discussion of Matsuura above. As can be seen Matsuura teaches all the limitations of claim 6 except the citation that the D/A converter that generates an analog signal obtained by performing non-linear conversion on an analog signal.

However, Da Costa (figure 2) teaches an active matrix display wherein an analog signal obtained by performing nonlinear conversion on an analog signal (for that, Da Costa teaches that a non-linear D/A can be used) (col. 9, lines 46-52).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to replace Matsuura's D/A with Da Costa's non-linear D/A because as motivated by Da Costa, by using a non-linear D/A, the number of bits may be reduced by concentrating the highest analog precision to the section of the transfer curve (when conducting gamma correction) where the transmission changes rapidly with voltage and allowing greater error tolerances on the section of the transfer curve where the transmission changes less rapidly (col. 9, lines 47-52).

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Allowable Subject Matter

9. Claims 2-3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

None of the cited art either singularly or in combinations teaches or fairly suggests a driving circuit for an electro-optical device that includes among other features, a plurality of sampling circuits provided on the substrate that sequentially sample and hold the analog image signal inputted in one horizontal scanning period, wherein the A/D conversion circuit comprising a plurality of A/D converters that convert analog image signals held in the plurality of sampling circuits into digital signals.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gillette et al. (US Patent No. 4,766,430) teaches a drive circuit for a liquid crystal display that includes an A/D converters.

Kanatani et al. (US patent NO. 5,414,443) teaches a drive circuit for a matrix-type LCD device.

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Maekawa (US patent NO. 6,256,024) teaches a driving circuit that includes sampling system for an analog video signals.

12. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

*Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA., Sixth Floor (Receptionist).*

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amr Awad whose telephone number is (703) 308-8485.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Saras, can be reached on (703) 305-9720.



Amr A. Awad

09/08/2002.